Justice/Public Safety/Homeland Security Telecommunications Interoperability Standards

Outputs

- Voice and data encryption standards for Project 25 digital radios.
- XML data element dictionary.
- TIA Telecommunications Systems Bulletins for testing Project 25 radios.

ITS is conducting a technical program aimed at providing effective interoperability and information sharing among dissimilar wireless telecommunications and information technology (IT) systems within the justice/public safety/homeland security community. The key to the program is the identification and/or development of interoperability standards to allow local, State, and Federal agencies to exchange information, without requiring substantial changes to internal systems or procedures. The ITS program is sponsored by two Federal agencies and one Federal program: National Communications System (NCS), National Institute of Justice (NIJ) (through its Advanced Generation of Interoperability for Law Enforcement (AGILE) Program), and Public Safety Wireless Network (PSWN) program (jointly sponsored by the Departments of Justice and Treasury). The tripartite ITS program is summarized below.

National Communications System Support

The Institute is assisting NCS's Technology and Programs Division in developing a comprehensive series of interoperability standards for digital land mobile radio (LMR) for public safety applications. Next generation LMR standards are being developed by the Federal Government, in conjunction with industry and local and State governments, within a group called Association of Public-Safety Communications Officials/National Association of State Telecommunications Directors/Federal (APCO/NASTD/FED) Project 25. This project consists of three phases. Phase 1, which has been completed, included the development of a comprehensive set of standards for 12.5-kHz digital LMRs. Phase 2, in progress, is developing a set of interoperability standards for narrowband (6.25 kHz) digital LMRs; standards defining TDMA radios with an equivalent 6.25 kHz/channel efficiency are also being developed. ITS efforts have mainly supported Phase 2. Phase 3 (also referred to as "Project 34") has also begun, and is focused on the development of standards for wideband mobile data applications.

NCS, Federal law enforcement agencies, and the National Security Agency, with assistance from ITS, are participating in the development of these standards, and are taking the lead in the development of related Information System Security (INFOSEC) standards. An ITS representative chairs the Project 25 Encryption Task Group and works closely with its members in developing Project 25 INFOSEC standards. ITS participates on the Telecommunications Industry Association (TIA) TR 8 Encryption Committee to ensure that TIA standards meet Government requirements. ITS also participates in other TIA TR 8 Committees and Project 25 task groups as necessary to ensure that the total suite of Project 25 LMR interoperability standards meets Federal requirements, and to continually assess Project 25's impact on Federal agencies. An ITS engineer represents NCS on the Project 25 Steering Committee. To date ITS has contributed to the development of standards for the encryption of voice and data sent over the Project 25 Common Air Interface, a standardized key fill interface for Project 25 equipment, and for the over-the-air-rekeying of Project 25 radios.

NIJ's AGILE Program Support

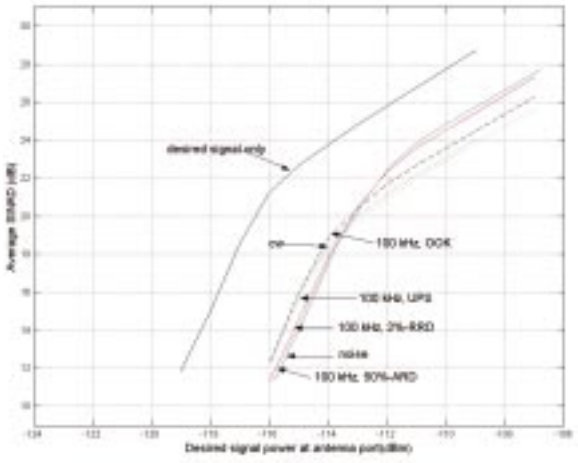
As the Department of Justice's science and technology arm for assisting State and local agencies, NIJ addresses wireless telecommunications and IT interoperability issues. In particular, NIJ's AGILE program has facilitated the efforts of the practitioners in the justice/public safety/homeland security community to coordinate and share information. The long-term thrust involves assistance toward standardization of interoperability approaches. The AGILE program continues to provide specialized technical support to help users define their requirements, and then assists the practitioners to address and satisfy those functional needs. This is done by recommending standards that most aptly specify the context of a nationwide information sharing framework. The

second thrust of the AGILE Program provides technical investigation and laboratory evaluation of interim interoperability products, services, and techniques to allow agencies to work better now while longer term standardization efforts are developed. ITS performs the AGILE standardization and evaluation activities under the auspices of NIST's Office of Law Enforcement Standards (OLES), one of NIJ's technology centers.

During FY 2002, considerable progress was made in the AGILE Program regarding standardization of IT applications by teaming with the Global Justice Information Network Advisory Committee (Global). Global, as the Group of Groups, represents all practitioners in the Justice community (e.g., law enforcement, courts, corrections, prosecutors, defense, etc.; see http://it.ojp.gov/global/index.html). ITS worked with Global's Infrastructure/Standards Working Group to develop a standard approach for XML (eXtensible Markup Language) implementation, along with a data element dictionary that can provide common "words" for a common "language" to be used by the justice/public safety/homeland security community. In addition, ITS helped design and develop a web-based Justice Standards Registry for Information Sharing to allow practitioners to list and discuss their interoperability standards, standards projects, and concepts that may benefit others (see http://it.ojp.gov/jsr/public/index.jsp). An Interoperability Research Laboratory (p. 69) was established at ITS to accommodate testing and evaluation of interim interoperability products and proposed ideas.

Public Safety Wireless Network (PSWN) Support

ITS provides technical support to the TIA TR8 (Project 25) Committee to develop Project 25 Standard documents. Specifically, ITS has had the responsibility for developing procedures to test the interoperability of radio systems engaged in conventional voice, over-the-air re-keying of encryption, trunking, and data applications. The procedures are TIA Telecommunications Systems Bulletins (TSB) and guide TSB users on the set-up and conduct of functional tests to assure that two Project 25 devices are interoperable. In addition, through AGILE and PSWN, ITS provides support to the ISSI Task Group of TR8 in the development of the Inter-RF Sub-System Interface (ISSI) standard for Project 25. This standard is needed to link the radio networks of cooperating jurisdictions and to link local radio systems to a nationwide network, such as proposed by the Treasury/Justice Integrated Wireless Network.



Susceptibility of an analog land mobile radio to various ultrawideband devices.

ITS developed and conducted tests to measure the performance of Public Safety radio receivers with ultrawideband interference. The information resulting from the tests is important as practitioners are expected to use land mobile radios in their vehicles or carry handheld radios while they also make use of ultra wide band equipment in support of their missions. Thus, the levels that cause interference to the radios are important to the community. The graph above shows the susceptibility of an analog land mobile radio to various, typical ultrawideband devices. The desired signal is an analog FM signal at the antenna port of the radio. The interference signals are the signals that cause the desired signal reception to degrade by 3 dB.

Recent Publications

TIA/EIA TSB-102.CABB Project 25 Interoperability Test Procedures: Over-The-Air-Rekeying (OTAR), Feb. 14, 2002.

Draft version TIA/EIA TSB-102.CABx Project 25 Interoperability Test Procedures Voice Operation in Trunked Systems, Sep. 2, 2002.

Presentation to Congressional, Federal, and State/local representatives: Invited paper on Emerging Technology Solutions at the NTIA/PSWN Public Safety Communications Interoperability Summit.

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